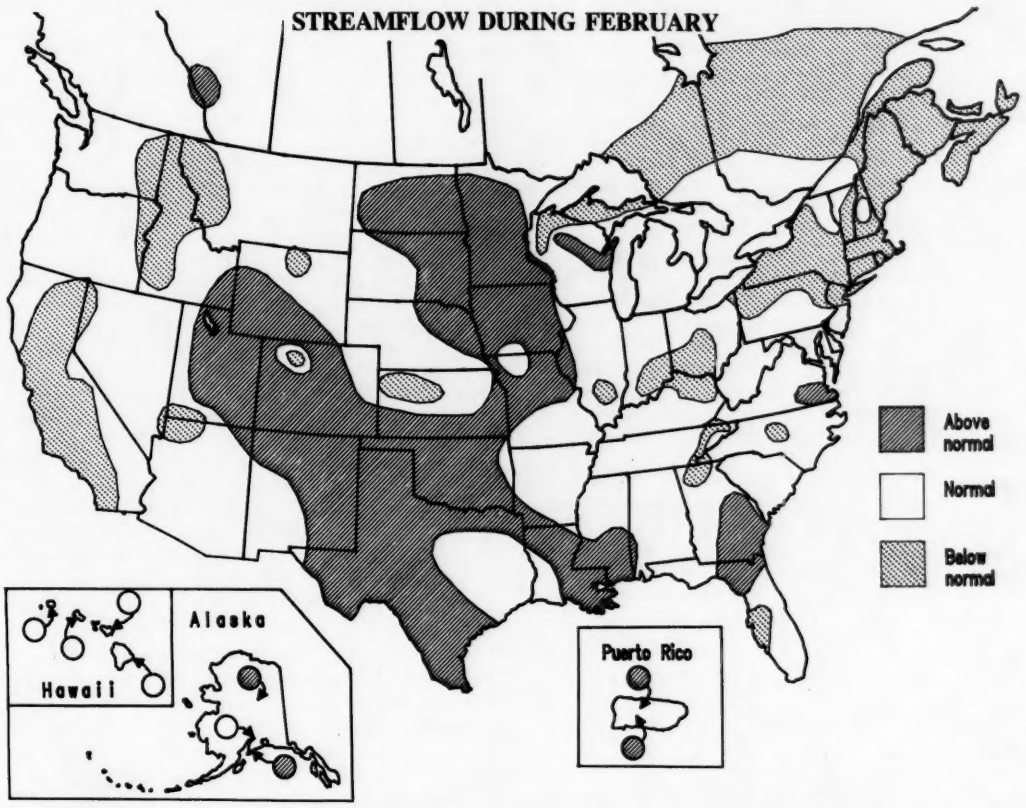
National Water Conditions

UNITED STATES
Department of the Interior
Geological Survey

CANADA
Department of the Environment
Water Resources Branch

FEBRUARY 1987



Streamflow generally decreased in much of the East, generally increased in the midcontinent, and changed variably in the West. Total February streamflow at the 191 index stations in southern Canada, the United States, and Puerto Rico was up 5.1 percent from that for January, but 3.0 percent below median for the month. Streamflow was in normal to above-normal range at about 72 percent of the 191 stations compared to the 82 percent in those ranges for last month. New February extremes occurred at six streamflow index stations: record-high monthly means at four index stations and record-low monthly means at two index stations.

February precipitation (data from National Weather Service) was above average over most of the conterminous United States with total precipitation exceeding 6 inches in 28 cities during the month. Record-high monthly totals fell at 13 cities and record-low monthly totals fell at 11 cities.

Average February elevations for the Great Lakes (data from National Ocean Service) were lower than those for both last month and last February except for Lake Ontario, which averaged 0.10 foot higher than last month and 0.20 foot higher than last February.

Utah's Great Salt Lake rose 0.25 foot during the month, reaching an elevation of 4,211.65 feet above National Geodetic Vertical Datum (NGVD) of 1929 on February 28, only 0.20 foot below last year's record high of 4,211.85 feet above NGVD of 1929 on June 3–8.

Contents of 83 percent of reporting reservoirs were near or above average for the end of February, compared with 85 percent for the end of January. Contents of Idaho's Boise River reservoirs increased to 67 percent of normal maximum (slightly above the end of February average) after being at an all-time low of 6 percent of normal maximum at the end of January.

The combined flow of the 3 largest rivers in the lower 48 States—Mississippi, St. Lawrence, and Columbia—averaged 949,000 cubic feet per second during February, 4.6 percent below median, and 32 percent below last month's flow.

SURFACE-WATER CONDITIONS DURING FEBRUARY 1987

February streamflow generally decreased seasonally in Alaska, British Columbia, Ontario, Michigan, Quebec, New Brunswick, Nova Scotia, Maine, New Hampshire, and Vermont; decreased contraseasonally in Ohio, Pennsylvania, New Jersey, Connecticut, Rhode Island, the Carolinas, and Georgia, and decreased variably in Colorado, Minnesota, Alabama, Maryland, Delaware, and New York. Flow changed variably in Hawaii, Utah, Idaho, Wyoming, Montana, North Dakota, Wisconsin, Indiana, Texas, Louisiana, Florida, and Puerto Rico; increased variably in Oregon; increased contraseasonally in Washington, Alberta, and Saskatchewan, and generally increased seasonally in the rest of the United States. The persistence/change map on page 3 shows where streamflow has persisted in the above- or below-normal range from January to February and also where streamflow has moved into the above- or below-normal range for February after being in a different range for January. The table below the map shows areal streamflow range conditions for the 191 index stations reporting data for February and compares total flow of the 191 stations reporting data for both January and February. Streamflow was in normal to above-normal range at about 72 percent of the 191 index stations in southern Canada, the United States, and Puerto Rico, compared to the 82 percent in those ranges for last month. New February extremes occurred at six streamflow index stations (see table on page 4): record- high monthly means at four index stations and record-low monthly means at two index stations.

February precipitation (see maps on page 4) was generally an inch or more above average in the area from Texas to Kansas, and eastward to the Atlantic coast according to provisional data from the National Weather Service. Precipitation was an inch or more below average in southern Alaska, Hawaii, coastal areas of the Pacific Northwest, southern Florida, and also in most of the Northeast. Total precipitation exceeded 6 inches in 28 cities (27 of them in the South) during the month, but was a February record high at only 1 of the 28 cities—Jackson, Mississippi (10.26 inches). Other record-high precipitation totals for the month (amounts in inches) fell at: Wichita, Kansas (3.31); Jackson, Mississippi (10.26); Roswell, New Mexico (2.02); Bismarck, North Dakota (1.65); Oklahoma City, Oklahoma (4.05); Abilene (3.55),Del Rio (3.47), Midland (1.98), San Angelo (4.43), and Wichita Falls (4.16), Texas; and Casper, Wyoming (1.41). Record-low totals for the month fell at: Bridgeport (0.45) and Hartford (0.46), Connecticut; Portland, Maine (0.04); Boston, Massachusetts; Helena, Montana (0.03); Concord, New Hampshire (0.03); Albany (0.26), New York City (0.82), Rochester (0.61), and Syracuse (0.65), New York; Youngstown, Ohio (0.55); and Providence, Rhode Island (0.30). The March through May outlook maps for both temperature and precipitation are shown on page 4.

Average February elevations for the Great Lakes (provisional data from National Ocean Service) were lower than those for both last month and last February except for Lake Ontario, which averaged 0.10 foot higher than last month and 0.20 foot higher than last February. Lake Erie averaged 0.21 foot lower than last month's record high but only 0.01 foot less than last year's February record high of 574.42 feet above National Geodetic Vertical Datum (NGVD) of 1929. Stage hydrographs for Lakes Superior, Huron, Erie, and Ontario are on page 5.

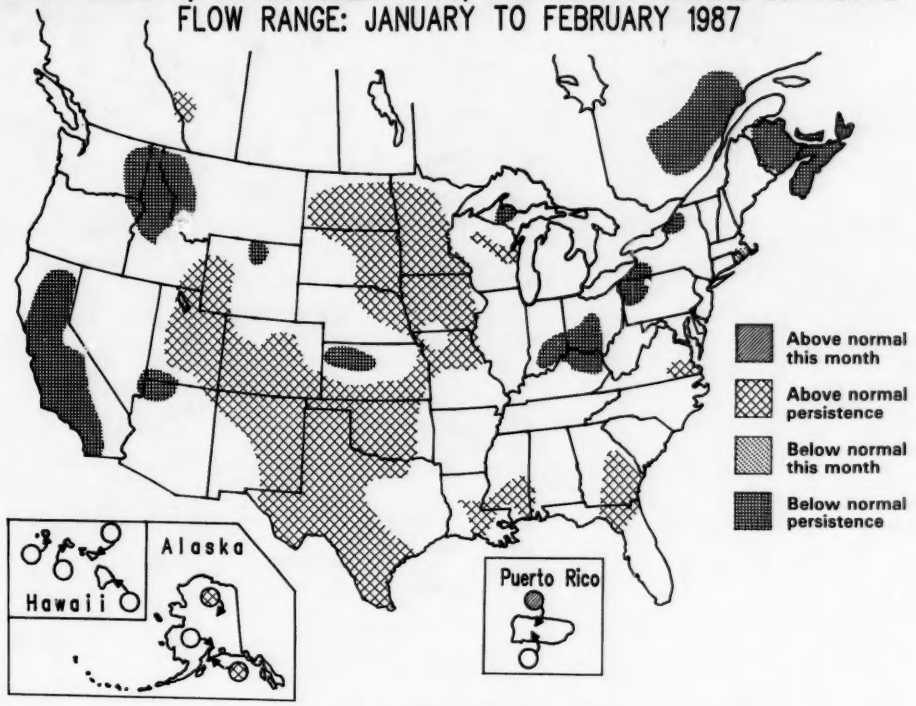
Utah's Great Salt Lake rose 0.25 foot during the month, reaching an elevation of 4,211.65 feet above NGVD of 1929 on February 28. Lake level is now 1.75 feet higher than it was a year ago, 0.95 foot above the seasonal low of 4,210.70 feet above NGVD of 1929 on September 15, 1986, and only 0.20 foot below last year's record high of 4,211.85 feet above NGVD of 1929 on June 3–8. A stage hydrograph of maximum and minimum annual elevations since 1847 (with the February 28, 1987, elevation as the end point) is on page 5.

Contents of 83 percent of reporting reservoirs were near or above average for the end of February, compared with 85 percent for the end of January. Most reporting reservoirs in the Carolinas, Georgia, Alabama, Wisconsin, Oklahoma, Texas, Colorado, Nevada, Arizona, and New Mexico had contents significantly above average for the end of February. The only reservoirs with both significant declines in contents during the month and significantly below-average contents for the end of the month were the "Seven Reservoir System" (Maine), Harriman and Somerset reservoirs (Vermont), Lakes Marion and Moultrie (South Carolina),and Lake Chelan (Washington). Contents of Idaho's Boise River reservoirs increased to 67 percent of normal maximum (slightly above the end of February average) after being at an all-time low of 6 percent of normal maximum at the end of January. Graphs of contents for seven reservoirs are shown on page 6 with contents for the 100 reporting reservoirs given on page 7.

The combined flow of the 3 largest rivers in the lower 48 States—Mississippi, St. Lawrence, and Columbia—averaged 949,000 cubic feet per second during February, 4.6 percent below median, and 32 percent below last month's flow. Flow hydrographs for both the combined and individual flows of the "Big 3" are shown on page 8. February flows of these three rivers are given in the Flow of Large Rivers table on page 9. Dissolved solids and water temperatures at five large river stations are given on page 8.

CONTENTS

PERSISTENCE IN, OR MOVEMENT INTO, THE BELOW-NORMAL OR ABOVE-NORMAL FLOW RANGE: JANUARY TO FEBRUARY 1987



SUMMARY OF FEBRUARY 1987 STREAMFLOW

[Flow ranges]

Area	Below normal range		Normal range		Above normal range		Number of stations	
	No.	Percent	No.	Percent	No.	Percent	Reporting data	Missing data
Conterminous United States.	43	26.4	77	47.2	43	26.4	163	0
Alaska, Hawaii, and Puerto Rico.	0	0.0	5	50.0	5	50.0	10	0
United States and Puerto Rico.	43	24.9	82	47.4	48	27.7	173	0
Southern Canada.....	10	55.6	7	38.9	1	5.6	18	0
Conterminous United States and southern Canada.	53	29.3	84	46.4	44	24.3	181	0
All sites.....	53	27.7	89	46.4	44	24.3	191	0

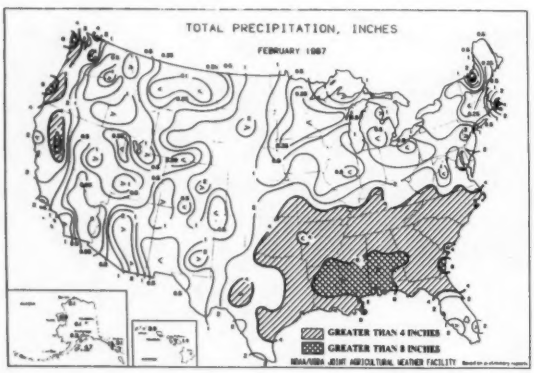
[Comparison of total monthly means with total monthly medians and last month's total monthly means]

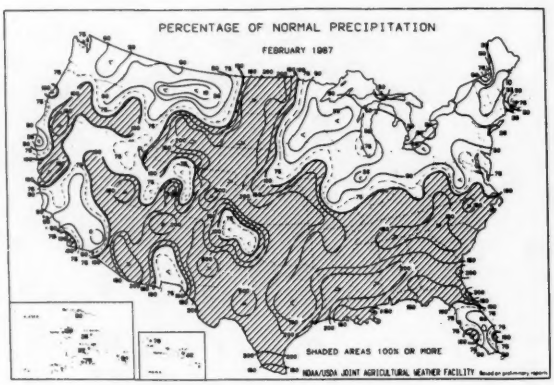
Total of February means (all sites).....	1,971,980 CFS
Total of February medians (all sites).....	2,032,370 CFS
Total of last month's means (all sites).....	*1,877,070 CFS
Total of February means compared to total of medians.....	−3.0 Percent
Total of February means compared to total of last month's means.....	+5.1 Percent

*Revised.

NEW EXTREMES DURING FEBRUARY 1987 AT STREAMFLOW INDEX STATIONS

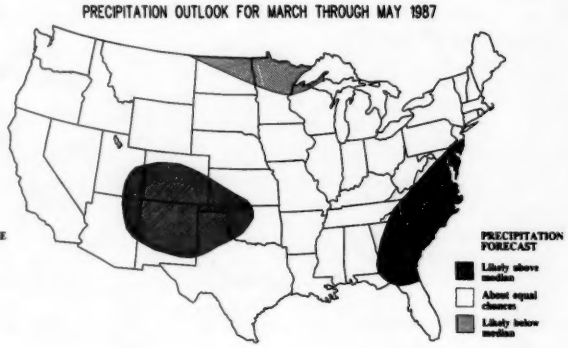
Station number	Stream and place of determination	Drainage area (square miles)	Years of record	Previous February extremes (period of record)		February 1987			
				Monthly mean in cfs (year)	Daily mean in cfs (year)	Monthly mean in cfs	Percent of median	Daily mean in cfs	Day
				HIGHS					
02320500	Suwanee River at Branford, Fla.	7,880	55	21,000 (1986)	38,600 (1986)	24,200	300	25,420	28
08276500	Rio Grande below Taos Junction Bridge, near Taos, N. Mex.	9,730	61	853 (1986)	1,760 (1937)	868	179	942	28
08408500	Delaware River near Red Bluff, N. Mex.	689	50	7.0 (1942)	7.6 (1942)	8.70	361	10.0	20
09379500	San Juan River near Bluff, Utah	23,000	72	3,604 (1932)	15,700 (1932)	3,694	328	4,920	15
				LOWS					
03020500	Oil Creek at Rouseville, Pa.	300	54	183 (1963)	50 (1961)	111	16	80	16
07100100	Outardes River at Outardes Falls, Quebec, Canada.	7,300	63	2,000 (1924)	510 (1969)	1,210	31	.....	...





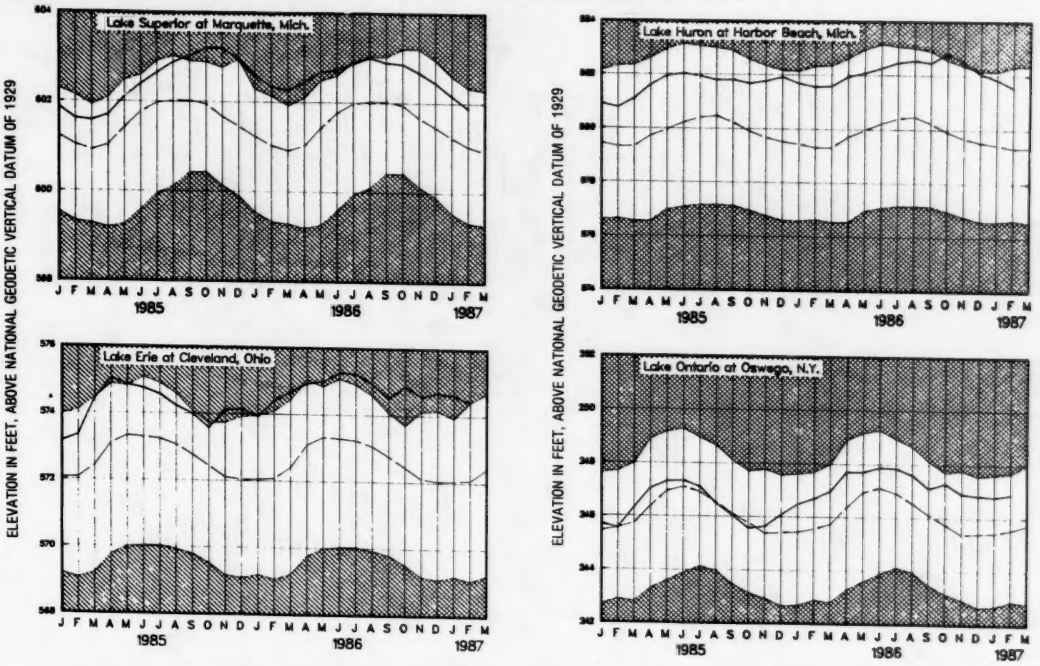
TEMPERATURE OUTLOOK FOR MARCH THROUGH MAY 1987

PRECIPITATION OUTLOOK FOR MARCH THROUGH MAY 1987

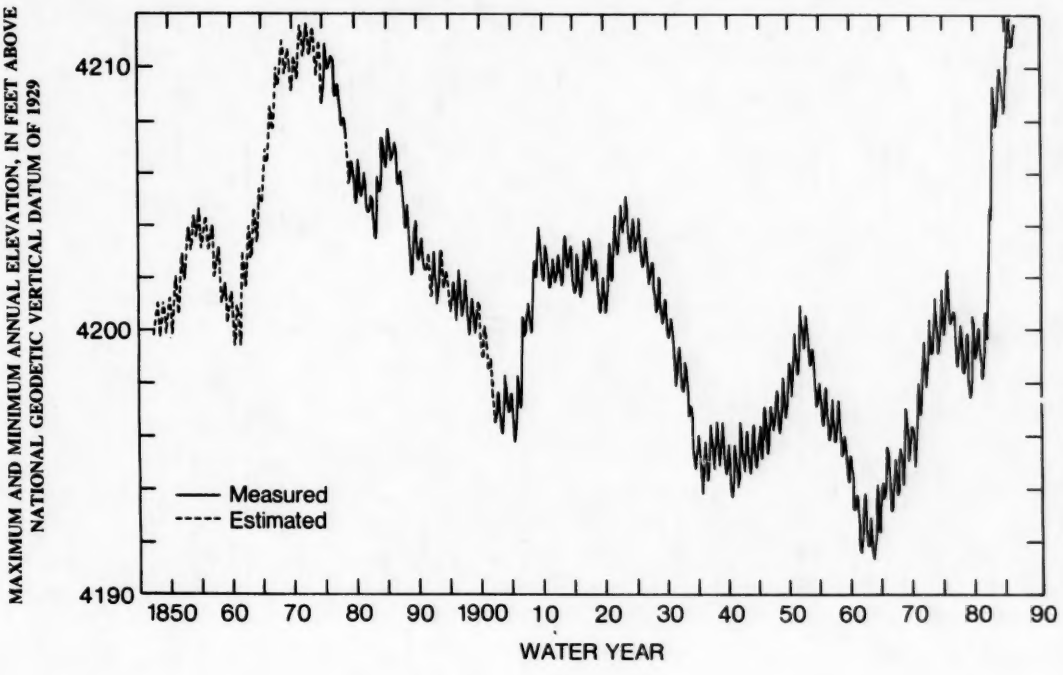


GREAT LAKES ELEVATIONS

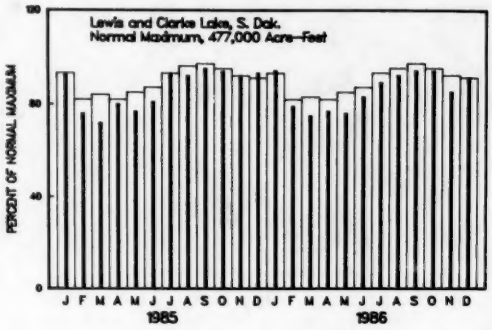
Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951–80. Heavy line indicates mean for current period. Data from National Weather Service.

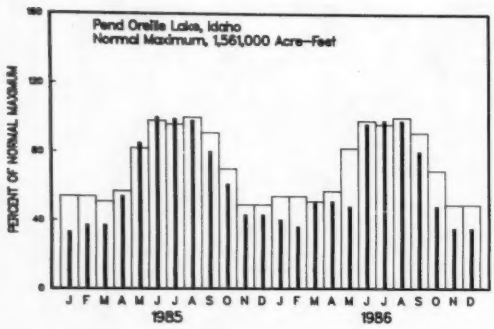


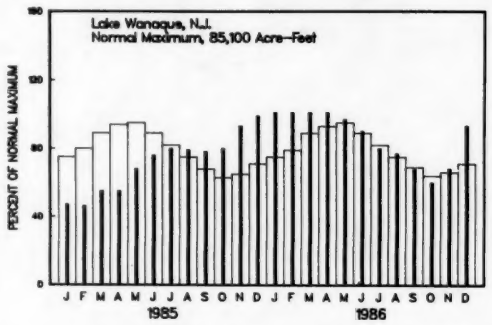
Fluctuations of Great Salt Lake, 1847 to February 28, 1987

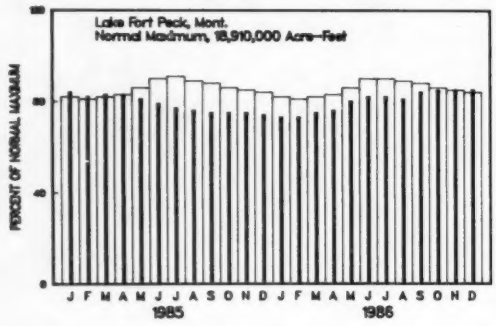


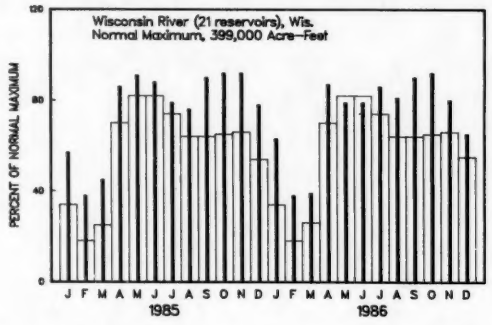
USABLE CONTENTS OF SELECTED RESERVOIRS AND RESERVOIR SYSTEMS

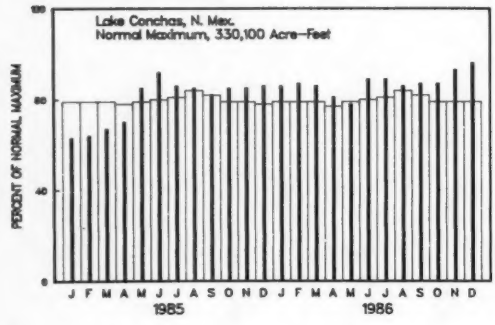


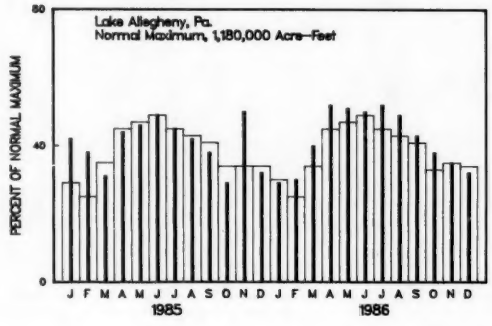












USABLE CONTENTS OF SELECTED RESERVOIRS NEAR END OF FEBRUARY 1987

[Contents are expressed in percent of reservoir capacity. The usable storage capacity of each reservoir is shown in the column headed "Normal maximum."]

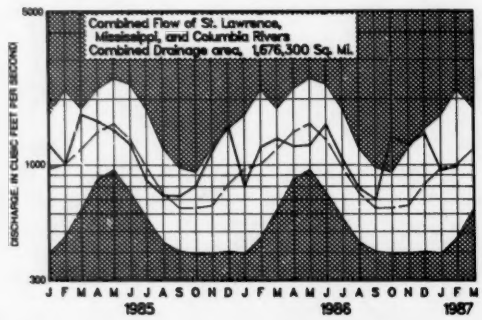
Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum				Normal maximum[a] (acre-feet)
	End of Feb. 1987	End of Feb. 1986	Average for end of Feb.	End of Jan. 1987	
NOVA SCOTIA					
Rossignol, Mulgrave, Falls Lake, St. Margaret's Bay, Black, and Ponhook Reservoirs(P)	35	34	59	40	[b]226,300
QUEBEC					
Allard (P)	27	51	30	60	280,600
Gouin (P)	65	57	52	78	6,954,000
MAINE					
Seven reservoir systems (MP)	29	52	41	43	4,107,000
NEW HAMPSHIRE					
First Connecticut Lake (P)	29	27	20	41	76,450
Lake Francis (FPR)	26	31	31	45	99,310
Lake Winnipesaukee (PR)	44	69	52	62	165,700
VERMONT					
Harriman (P)	25	31	33	45	116,200
Somerset (P)	45	50	51	64	57,390
MASSACHUSETTS					
Cobble Mountain and Borden Brook (MP)	72	84	69	76	77,920
NEW YORK					
Great Sacandaga Lake (FPR)	29	39	37	42	786,700
Indian Lake (FMP)	57	68	42	71	103,300
New York City reservoir system (MW)	83	85	83	87	1,680,000
NEW JERSEY					
Wanaque (M)	90	101	80	94	85,100
PENNSYLVANIA					
Allegheny (FPR)	28	30	26	31	1,180,000
Pymatuning (FMR)	72	89	86	72	188,000
Raystown Lake (FR)	68	68	55	67	761,900
Lake Wallenpaupack (PR)	49	55	51	58	157,800
MARYLAND					
Baltimore municipal system (M)	74	78	89	71	261,900
NORTH CAROLINA					
Bridgewater (Lake James) (P)	90	83	84	91	288,800
Narrows (Badin Lake) (P)	100	84	100	91	128,900
High Rock Lake (P)	83	28	75	61	234,800
SOUTH CAROLINA					
Lake Murray (P)	86	83	71	89	1,614,000
Lakes Marion and Moultrie (P)	69	79	76	76	1,862,000
SOUTH CAROLINA—GEORGIA					
Clark Hill (FP)	75	62	68	82	1,730,000
GEORGIA					
Burton (PR)	82	23	66	80	104,000
Sinclair (MPR)	100	87	87	96	214,000
Lake Sidney Lanier (FMPR)	52	51	57	48	1,686,000
ALABAMA					
Lake Martin (P)	82	73	76	86	1,375,000
TENNESSEE VALLEY					
Clinch Projects: Norris and Melton Hill Lakes (FPR)	41	42	39	41	2,293,000
Douglas Lake (FPR)	23	22	22	23	1,394,000
Hiwassee Projects: Chatuge, Nottely, Hiwassee, Apalachia, Blue Ridge, Ocoee 3, and Parksville Lakes (FPR)	52	48	50	52	1,012,000
Holston Projects: South Holston, Watauga, Boone, Fort Patrick Henry, and Cherokee Lakes (FPR)	46	49	42	46	2,880,000
Little Tennessee Projects: Nantahala, Thorpe, Fontana, and Chilhowee Lakes (FPR)	47	38	48	47	1,478,000
WISCONSIN					
Chippewa and Flambeau (PR)	59	49	27	60	365,000
Wisconsin River (21 reservoirs) (PR)	25	38	19	40	399,000
MINNESOTA					
Mississippi River headwater system (FMR)	22	18	18	27	1,640,000
NORTH DAKOTA					
Lake Sakakawea (Garrison) (FIPR)	84	74	80	86	22,700,000
SOUTH DAKOTA					
Angostura (I)	94	56	75	90	127,600
Belle Fourche (I)	74	37	53	68	185,200
Lake Francis Case (FIP)	72	70	73	66	4,834,000
Lake Oahe (FIP)	83	80	. . .	80	22,530,000
Lake Sharpe (FIP)	100	101	97	100	1,725,000
Lewis and Clark Lake (FIP)	78	79	82	91	432,000

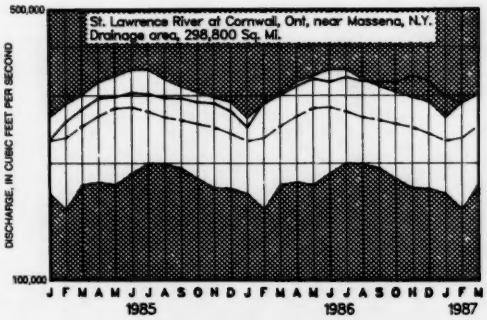
Reservoir Principal uses: F–Flood control I–Irrigation M–Municipal P–Power R–Recreation W–Industrial	Percent of normal maximum				Normal maximum[a] (acre-feet)
	End of Feb. 1987	End of Feb. 1986	Average for end of Feb.	End of Jan. 1987	
NEBRASKA					
Lake McConaughy (IP)	82	84	75	81	1,948,000
OKLAHOMA					
Eufaula (FRP)	102	90	86	107	2,378,000
Keystone (FPR)	109	84	92	86	661,000
Tenkiller Ferry (FPR)	106	105	91	106	628,200
Lake Altus (FIMR)	101	26	50	100	133,000
Lake O'The Cherokees (FPR)	112	92	81	88	1,492,000
OKLAHOMA—TEXAS					
Lake Texoma (FMPRW)	100	94	88	100	2,722,000
TEXAS					
Bridgeport (IMW)	97	79	47	94	386,400
Canyon (FMR)	99	98	79	100	385,600
International Amistad (FIMPW)	84	70	83	84	3,497,000
International Falcon (FIMPW)	79	28	72	72	2,668,000
Livingston (IMW)	103	100	88	103	1,788,000
Possum Kingdom (IMPRW)	97	88	95	94	570,200
Red Bluff (PI)	87	24	30	83	307,000
Toledo Bend (P)	94	89	87	91	4,472,000
Twin Buttes (FIM)	55	12	31	50	177,800
Lake Kemp (IMW)	101	92	85	101	268,000
Lake Meredith (FWM)	29	30	37	29	796,900
Lake Travis (FIMPRW)	99	102	82	103	1,144,000
MONTANA					
Canyon Ferry (FIMPR)	76	73	78	76	2,043,000
Fort Peck (FPR)	84	73	81	85	18,910,000
Hungry Horse (FIPR)	67	66	64	70	3,451,000
WASHINGTON					
Ross (PR)	31	46	42	57	1,052,000
Franklin D. Roosevelt Lake (IP)	94	97	68	94	5,022,000
Lake Chelan (PR)	25	35	36	38	676,100
Lake Cushman (PR)	55	80	84	42	359,500
Lake Merwin (P)	99	88	96	101	245,600
IDAHO					
Boise River (4 reservoirs) (FIP)	67	67	64	6	1,235,000
Coeur d'Alene Lake (P)	32	126	53	16	238,500
Pend Oreille Lake (FP)	35	36	53	39	1,561,000
IDAHO—WYOMING					
Upper Snake River (8 reservoirs) (MP)	66	61	71	57	4,401,000
WYOMING					
Boysen (FIP)	74	75	67	78	802,000
Buffalo Bill (IP)	65	65	62	64	421,300
Keyhole (F)	36	29	44	34	193,800
Pathfinder, Seminoe, Alcova, Kortes, Glendo, and Guernsey Reservoirs (I)	71	65	51	69	3,056,000
COLORADO					
John Martin (FIR)	92	92	20	87	364,400
Taylor Park (IR)	71	67	55	72	106,200
Colorado–Big Thompson project (I)	82	74	56	82	730,300
COLORADO RIVER STORAGE PROJECT					
Lake Powell; Flaming Gorge, Fontenelle, Navajo, and Blue Mesa Reservoirs (IFPR)	83	86	. . .	84	31,620,000
UTAH—IDAHO					
Bear Lake (IPR)	74	77	59	74	1,421,000
CALIFORNIA					
Folsom (FIP)	54	63	59	45	1,000,000
Hetch Hetchy (MP)	34	59	30	36	360,400
Isabella (FIR)	43	54	30	43	568,100
Pine Flat (FI)	64	79	57	61	1,001,000
Clair Engle Lake (Lewiston) (P)	77	83	80	74	2,448,000
Lake Almanor (P)	77	85	52	73	1,036,000
Lake Berryessa (FIMW)	85	103	88	83	1,600,000
Millerton Lake (FI)	31	94	66	35	503,200
Shasta Lake (FIPR)	77	92	75	69	4,377,000
CALIFORNIA—NEVADA					
Lake Tahoe (IPR)	66	90	53	66	744,600
NEVADA					
Rye Patch (I)	75	72	62	71	194,300
ARIZONA—NEVADA					
Lake Mead and Lake Mohave (FIMP)	94	89	69	94	27,970,000
ARIZONA					
San Carlos (IP)	80	94	28	79	935,100
Salt and Verde River system (IMPR)	86	87	48	84	2,019,100
NEW MEXICO					
Conchas (FIR)	101	87	79	98	330,100
Elephant Butte and Caballo (FIPR)	96	95	35	94	2,442,000

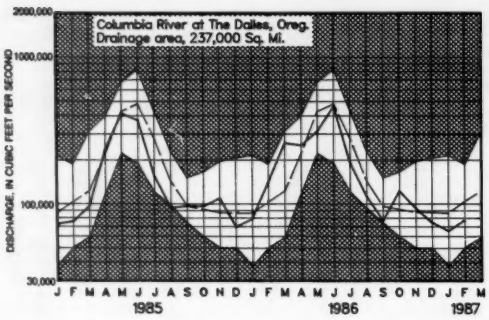
[a] 1 acre-foot = 0.04356 million cubic feet = 0.326 million gallons = 0.504 cubic feet per second day.
[b] Thousands of kilowatt-hours (the potential electric power that could be generated by the volume of water in storage).

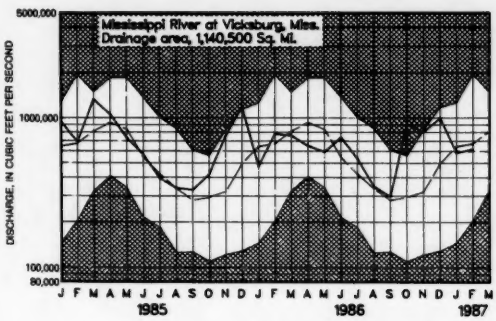
HYDROGRAPHS FOR THE "BIG THREE" RIVERS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates median of monthly values for reference period, 1951-80. Heavy line indicates mean for current period.









Provisional data; subject to revision

DISSOLVED SOLIDS AND WATER TEMPERATURES, FOR FEBRUARY 1987, AT DOWNSTREAM SITES ON FIVE LARGE RIVERS

Station number	Station name	February data of following calendar years	Stream discharge during month	Dissolved-solids concentration[a]		Dissolved-solids discharge[a]			Water temperature[b]		
			Mean (cfs)	Minimum (mg/L)	Maximum (mg/L)	Mean	Minimum	Maximum	Mean in °C	Minimum, in °C	Maximum, in °C
						(tons per day)					
01463500	Delaware River at Trenton, NJ (Morrisville, PA).	1987	6,371	109	131	1,995	1,450	2,709	2.5	0.5	5.0
		1945—86	13,670	61	144	....	647	15,600	...	0	8.5
		(Extreme yr)		(1954)	(1977)		(1976)	(1984)			
			[c]12,240								
07289000	Mississippi River at Vicksburg, MS.	1987	620,000	234	276	429,900	370,300	477,600	7.0	6.0	7.5
		1976—86	629,700	155	288	343,900	108,000	628,200	4.5	0	10.5
		(Extreme yr)		(1982)	(1986)		(1977)	(1986)			
			[c]672,800								
03612500	Ohio River at lock and dam 53, near Grand Chain, IL (streamflow station at Metropolis, IL).	1987	254,000	224	261	....	138,000	184,000	...	3.5	5.5
		1955—86	438,600	98	308	....	44,900	419,000	...	0	10.0
		(Extreme yr)		(1957)	(1967)		(1955)	(1974)			
			[c]410,900								
06934500	Missouri River at Hermann, MO (60 miles west of St. Louis, MO).	1987	76,100	377	452	82,300	66,900	90,700	5.0	4.0	6.5
		1976—86	71,550	205	537	72,330	23,500	237,000	3.5	0	12.0
		(Extreme yr)		(1985)	(1985)		(1977)	(1985)			
			[c]49,190								
14128910	Columbia River at Warrendale, OR (streamflow station at The Dalles, OR).	1987	139,000	99	110	40,800	32,600	50,400	4.0	3.1	5.0
		1976—86	180,600	87	128	53,700	24,800	106,500	3.5	0.5	7.0
		(Extreme yr)		(1976)	(1977, 1986)		(1977)	(1982)			
			[c]104,800								

[a]Dissolved-solids concentrations, when not analyzed directly, are calculated on basis of measurements of specific conductance.
[b]To convert °C to °F: [(1.8 X °C) + 32] = °F.
[c]Median of monthly values for 30-year reference period, water years 1951—80, for comparison with data for current month.

Provisional data; subject to revision

FLOW OF LARGE RIVERS DURING FEBRUARY 1987

Station number	Stream and place of determination	Drainage area (square miles)	Average discharge through September 1980 (cubic feet per second)	February 1987					
				Monthly mean discharge (cubic feet per second)	Percent of median monthly discharge, 1951—80	Change in discharge from previous month (percent)	Discharge near end of month		
							Cubic feet per second	Million gallons per day	Date
01014000	St. John River below Fish River at Fort Kent, Maine	5,690	9,647	1,354	69	−52	1,110	717	28
01318500	Hudson River at Hadley, N.Y.	1,664	2,909	1,320	77	−20	1,200	780	28
01357500	Mohawk River at Cohoes, N.Y.	3,456	5,734	2,470	50	−32	2,050	1,324	28
01463500	Delaware River at Trenton, N.J.	6,780	11,750	6,371	52	−37	5,070	3,276	28
01570500	Susquehanna River at Harrisburg, Pa.	24,100	34,530	29,600	73	+9	15,500	10,020	25
01646500	Potomac River near Washington, D.C.	11,560	[1]11,490	[1]13,400	84	+14	12,900	8,340	28
02105500	Cape Fear River at William O. Huske Lock near Tarheel, N.C.	4,810	5,005	8,000	89	−32	20,000	13,000	28
02131000	Pee Dee River at Peedee, S.C.	8,830	9,851	13,400	88	−24	12,700	8,210	26
02226000	Altamaha River at Doctortown, Ga.	13,600	13,880	42,120	191	−3	31,400	20,290	27
02320500	Suwannee River at Branford, Fl.	7,880	6,987	24,200	300	+67	25,420	16,430	28
02358000	Apalachicola River at Chattahoochee, Fl.	17,200	22,570	37,000	116	+67	34,210	22,110	27
02467000	Tombigbee River at Demopolis lock and dam near Coatopa, Ala.	15,400	23,300	44,380	99	−7	107,600	69,540	28
02489500	Pearl River near Bogalusa, La.	6,630	9,768	29,140	171	+37	53,000	34,300	28
03049500	Allegheny River at Natrona, Pa.	11,410	[1]19,480	[1]10,000	39	−32	7,360	4,756	25
03085000	Monongahela River at Braddock, Pa.	7,337	[1]12,510	[1]15,910	86	+1	11,400	7,370	24
03193000	Kanawha River at Kanawha Falls, W.Va.	8,367	12,590	18,310	96	+26	14,400	9,310	23
03234500	Scioto River at Higby, Ohio.	5,131	4,547	1,716	24	−20	1,160	750	27
03294500	Ohio River at Louisville, Ky.[2]	91,170	116,00	138,600	79	+13	206,200	133,300	26
03377500	Wabash River at Mount Carmel, Ill.	28,635	27,220	18,360	49	+24	14,200	9,180	28
03469000	French Broad River below Douglas Dam, Tenn.	4,543	6,798	7,561	74	+18	. . .	. . .	. .
04084500	Fox River at Rapide Croche Dam, near Wrightstown, Wis.[2]	6,150	4,163	5,649	156	+3	4,214	2,723	28
04264331	St. Lawrence River at Cornwall, Ontario–near Massena, N.Y.[3]	298,800	242,700	285,600	123	−4	325,000	210,100	28
02NG001	St. Maurice River at Grand Mere, Quebec	16,300	25,150	1,440	23	−65	18,600	12,020	27
05082500	Red River of the North at Grand Forks, N.Dak.	30,100	2,551	1,622	146	−5	1,740	1,125	22
05133500	Rainy River at Manitou Rapids, Minn.	19,400	11,830	7,900	85	−1	7,500	4,850	23
05330000	Minnesota River near Jordan, Minn.	16,200	3,402	1,890	374	−22	1,900	1,230	28
05331000	Mississippi River at St. Paul, Minn.	36,800	[1]10,610	8,720	176	−14	8,400	5,430	28
05365500	Chippewa River at Chippewa Falls, Wis.	5,600	5,100	2,070	63	−22	2,000	1,300	27
05407000	Wisconsin River at Muscoda, Wis.	10,300	8,617	7,318	106	−1	7,657	4,948	28
05446500	Rock River near Joslin, Ill.	9,551	5,873	6,080	137	+6	4,500	2,910	28
05474500	Mississippi River at Keokuk, Iowa.	119,000	62,620	52,160	126	+1	50,100	32,380	28
06214500	Yellowstone River at Billings, Mont.	11,796	7,038	2,730	101	−10	2,390	1,544	27
06934500	Missouri River at Hermann, Mo.	524,200	79,490	76,500	156	+9	85,000	54,900	28
07289000	Mississippi River at Vicksburg, Miss.[4]	1,140,500	576,600	620,000	92	+6	639,000	413,000	23
07331000	Washita River near Dickson, Okla.	7,202	1,368	4,650	1,129	+35	3,510	2,268	28
08276500	Rio Grande below Taos Junction Bridge, near Taos, N.Mex.	9,730	725	868	179	+19	942	608	28
09315000	Green River at Green River, Utah.	44,850	6,298	5,580	186	+5	6,250	4,164	18
11425500	Sacramento River at Verona, Calif.	21,257	18,820	16,080	42	+39	11,300	7,300	24
13269000	Snake River at Weiser, Idaho.	69,200	18,050	14,400	74	−25	11,800	7,630	28
13317000	Salmon River at White Bird, Idaho.	13,550	11,250	4,090	89	+11	3,760	2,430	28
13342500	Clearwater River at Spalding, Idaho.	9,570	15,480	4,950	50	+54	3,900	2,520	27
14105700	Columbia River at The Dalles, Oreg.[5]	237,000	[1]193,100	[1]77,700	74	+19	155,400	100,440	25
14191000	Willamette River at Salem, Oreg.	7,280	[1]23,510	[1]45,900	99	+41	17,700	11,440	25
15515500	Tanana River at Nenana, Alaska.	25,600	23,460	7,211	113	−13	6,800	4,390	28
08MF005	Fraser River at Hope, British Columbia.	83,800	96,290	33,440	98	−6	31,530	20,380	27

[1]Adjusted.
[2]Records furnished by Corps of Engineers.
[3]Records furnished by Buffalo District, Corps of Engineers, through International St. Lawrence River Board of Control. Discharges shown are considered to be the same as discharge at Ogdensburg, N.Y. when adjusted for storage in Lake St. Lawrence.
[4]Records of daily discharge computed jointly by Corps of Engineers and Geological Survey.
[5]Discharge determined from information furnished by Bureau of Reclamation, Corps of Engineers, and Geological Survey.

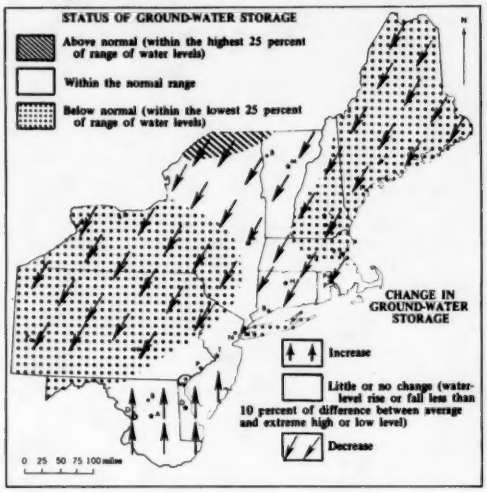
GROUND-WATER CONDITIONS DURING FEBRUARY 1987

Ground-water levels continued to decline in northern and central parts of the Northeast but rose in most of Maryland, Delaware, and southern New Jersey. (See map.) Near the end of February, levels were below average in Maine, much of New Hampshire, and also in central and western New York State (and on Long Island) and most of Pennsylvania. Elsewhere in the Northeast, levels were generally in the normal range for this time of year.

In the Southeastern States, ground-water levels rose in Virginia, and rose in most observation wells in Georgia. Levels declined in Kentucky. Net water-level changes during the month were mixed in North Carolina, Arkansas, Louisiana, and Mississippi. Water levels were above average in Kentucky and below average in Arkansas and Louisiana. Levels were mixed with respect to average in Virginia, North Carolina, and Florida. A new low ground-water level for February was recorded in the key well at Memphis, in western Tennessee. Despite a net rise in level in the key well at Stuttgart, Arkansas, a new low level for February was established. This is the second consecutive monthend low in this well.

In the central and western Great Lakes States, ground-water levels declined in Wisconsin, Michigan, Ohio, and Iowa, and showed mixed changes in Minnesota. Levels were near or above average in Wisconsin, and were in the normal range in Indiana. Levels were mixed with respect to average in Minnesota, Michigan, and Iowa.

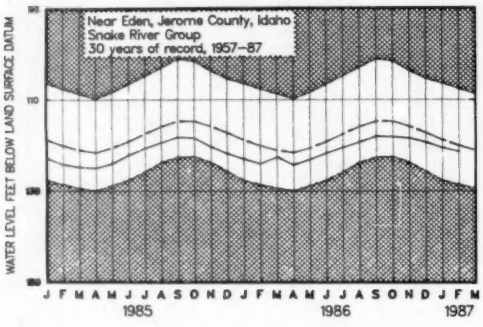
In the Western States, ground-water levels rose in Washington and North Dakota. Levels declined in five

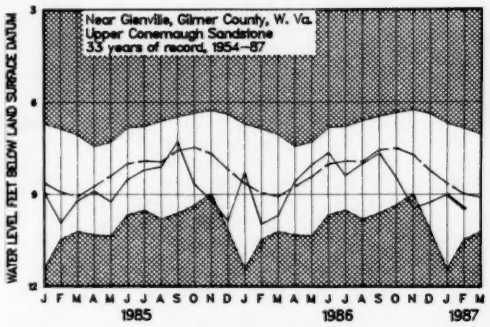


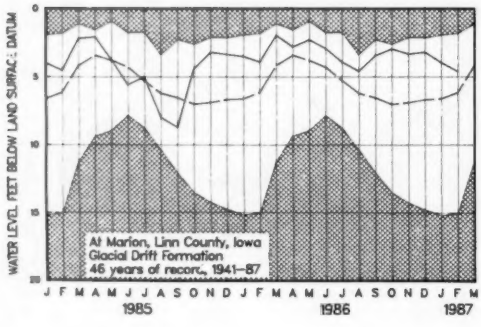
Map showing ground-water storage near end of February and change in ground-water storage from end of January to end of February.

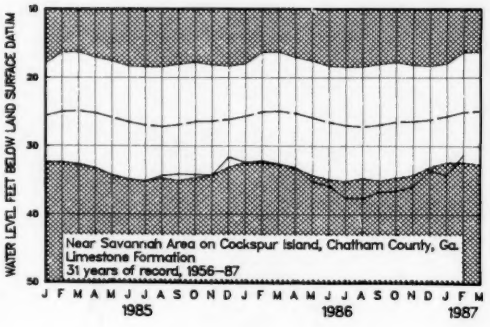
MONTH-END GROUND-WATER LEVELS IN KEY WELLS

Unshaded area indicates range between highest and lowest record for the month. Dashed line indicates average of monthly levels in previous years. Heavy line indicates level for current period.









of the six key wells in Idaho. Net changes in level were mixed in other Western States. Water levels were above average in North Dakota and Nebraska; levels were mixed with respect to average in other States. New high groundwater levels for February were reached in North Dakota and Nevada. The level in the Las Vegas Valley well in Nevada declined to equal the February low established in 1983. A new low level for February was reached in the Thomas County key well in Kansas. Despite a net rise during the month, a new February low was recorded in the El Paso key well in Texas. The level in the Berrendo-Smith observation well in the Roswell artesian basin of Pecos Valley rose more than a foot, reaching a new all-time high in 20 years of record. The level in the Dayton well, also in New Mexico, in the southern part of the Roswell basin, declined slightly, reaching a new all-time low in 44 years of record.

Provisional data; subject to revision

WATER LEVELS IN KEY OBSERVATION WELLS IN SOME REPRESENTATIVE AQUIFERS IN THE CONTERMINOUS UNITED STATES—FEBRUARY 1987

Aquifer and Location	Water level in feet with reference to land-surface datum	Departure from average in feet	Net change in water level in feet since:		Year records began	Remarks
			Last month	Last year		
Glacial drift at Hanska, south-central Minnesota.	−6.82	+2.11	−0.68	+0.50	1942	
Glacial drift at Roscommon in north-central part of Lower Peninsula, Michigan.	−4.81	+0.15	−0.34	−0.48	1935	
Glacial drift at Marion, Iowa.....	−4.60	+1.22	−0.64	−0.70	1941	
Glacial drift at Princeton in northwestern Illinois.	−8.35	+3.96	−0.31	−1.35	1943	
Petersburg Granite, southeastern Piedmont near Fall Zone, Colonial Heights, Virginia.	−12.69	+2.12	+0.51	+0.69	1939	
Glacial outwash sand and gravel, Louisville, Kentucky (U.S. well no. 2).	−18.63	+6.71	−0.07	−1.40	1946	
500-foot sand aquifer near Memphis, Tennessee (U.S. well no. 2).	−105.44	−16.24	−0.18	−1.31	1941	February low.
Granite in eastern Piedmont Province, Chapel Hill, North Carolina (U.S. well no. 5).	−44.89	−2.16	+0.57	−2.93	1931	
Sparta Sand in Pine Bluff industrial area, Arkansas.	−230.45	−23.18	+0.65	−12.60	1958	
Eutaw Formation in the City of Montgomery, Alabama (U.S. well no. 4).	−22.8	−3.6	+2.3	−1.1	1952	
Limestone aquifer on Cockspur Island, Savannah area, Georgia (U.S. well no. 6).	−31.28	−5.59	+2.93	+0.86	1956	
Sand and gravel in Puget Trough, Tacoma, Washington.	−100.66	+7.40	+0.35	+0.32	1952	
Pleistocene glacial outwash gravel, North Pole, northern Idaho (U.S. well no. 3).	−465.3	−3.4	−0.5	−3.4	1929	
Snake River Group: Snake River Plain Aquifer, at Eden, Idaho (U.S. well no. 4).	−121.4	−1.0	−0.8	+2.6	1957	
Alluvial valley fill in Flowell area, Millard County, Utah (U.S. well no. 9).	−7.22	+16.92	−0.53	−3.12	1929	
Alluvial sand and gravel, Platte River Valley, Ashland, Nebraska (U.S. well no. 6).	−3.75	+1.54	−0.05	+1.40	1935	
Alluvial valley fill in Steptoe Valley, Nevada....	−6.89	+5.64	+0.28	+0.22	1950	February high.
Pleistocene terrace deposits in Kansas River valley, at Lawrence, northeastern Kansas.	−17.52	+3.66	−0.38	−0.12	1953	
Alluvium and Paso Robles clay, sand, and gravel, Santa Maria Valley, California	−132.30	+11.41	+16.24	−4.34	1957	
Valley fill, Elfrida area, Douglas, Arizona (U.S. well no. 15).	−102.6	−22.9	+0.3	+1.7	1951	
Hueco bolson, El Paso area, Texas.....	−264.79	−18.45	+0.81	−1.25	1965	February low.
Evangeline aquifer, Houston area, Texas.....	−312.66	−15.82	+2.85	−4.14	1965	

NATIONAL WATER CONDITIONS

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